

Remarks and Arguments

Claims 26-68, 76, and 77 are pending in this application. No claims have been amended, added, or cancelled. Claims 45-68 have been withdrawn from consideration.

Rejections under 35 U.S.C. § 103

Kim and Burkett

Claims 28-44, 76, and 77 have been rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,239,210 to Kim et al. ("Kim") in view of U.S. Patent No. 5,539,078 to Burkett et al. ("Burkett"). Applicants respectfully traverse this rejection.

The Examiner again cites Kim for teaching oxygen barrier and oxygen absorbing resins, yet admits that Kim fails to teach drying of the resins. (*First Office Action* 02/27/06 at p. 5.) Burkett is cited for allegedly teaching that crystallizable polymers with high molecular weights can be obtained by subjecting the resins to a solid-stating process below the melting point of the polymer in the presence of a vacuum or a nitrogen purge, where this process would "intrinsically aid in enhancing the oxygen-scavenging capability of the composition." (*Id.*) In the present Office Action, the Examiner alleges that Burkett teaches that intrinsic viscosity is increased by solid stating. (*Office Action* at p. 4.)

Applicants respectfully disagree and reiterate the arguments from the previous response. Applicants also respectfully submit that there is no suggestion to apply a heat treatment step of Burkett to the polyamide of Kim. Kim is directed to oxygen barrier and oxygen absorbing compositions comprising blends of xylylene group-containing polyamides, polyesters, and cobalt octoate. (*Kim* at abstract.) Burkett is directed to the preparation of manufacturing linear random polyester copolymers. (*Burkett* at col. 1, ll. 6-7.) According to the "Background" section of Burkett, it was known that linear polyesters are made in two stages: (1) the first stage of esterification or transesterification, involves reacting a dicarboxylic acid or diester with a diol at elevated temperatures, producing water or the corresponding alcohol as a byproduct, and (2) the second stage involves polycondensation in the presence one or more

catalysts under vacuum to withdraw unwanted byproducts such as additional water and excess diol. (*Id.* at col. 1, ll. 12-21.)

Burkett also states that it was known in the preparation of polyesters to produce crystallizable copolymers with high molecular weights and high melting points by solid state polymerizing "partially formed polyesters" at a temperature below the melting in the presence of a vacuum or a nitrogen purge to remove reaction byproducts. (*Id.* at col. 1, ll. 30-36.) This solid state polymerization is performed until the intrinsic viscosity of the polymer reaches a certain desired level, e.g., from about 0.6 dl/g to about 1.0 dl/g or even higher. (*Id.* at col. 1, ll. 39-43.) This is shown by Burkett in the Examples, where a low molecular weight PEN having an intrinsic viscosity of 0.17 (prepared in Example 1) was further polymerized to prepare an "intermediate polycondensation product." (*Id.* at col. 8, ll. 57-58, Example 2.) This product was then heated under vacuum to form a copolymer having an IV of 0.59. (*Id.* at col. 9, ll. 2-3.) Example 4 describes further heating of this copolymer to achieve an IV of 0.85. (*Id.* at col. 9, ll. 59-63.)

One of ordinary skill in the art would readily appreciate that Burkett is directed to improved methods of making polyester copolymers. The specification demonstrates that Burkett prepares polymers from nonpolymeric starting materials and increases the molecular weight of the resulting intermediate products by a heating process until the intrinsic viscosity reaches 0.6 or higher. Because Burkett makes the polymers, Burkett necessarily produces unwanted byproducts and must perform a heating step to remove these byproducts. Burkett teaches in the "Background" section that such removal is well known in the art of synthesizing polymers.

Kim is distinct from Burdett in that Kim is not directed to making polyester copolymers, or any polymers at all, from molecular starting materials. Rather, Kim obtains commercially available polaymide from Toyobo or Mitsubishi Gas Chemicals Company, and blends it with commercially available PET from Eastman, Hoechst Celanese, ICI, Shell Chemical, or DuPont. (*Kim* at col. 5, ll. 62-67.) One of ordinary skill in the art would presume that commercially available polyamides were prepared

with processes that involved the removal of unwanted polymerization byproducts. In fact, Kim provides examples of bottles having low oxygen permeability without applying the heating step of Burkett. Therefore, one of ordinary skill in the art would determine that there is no need to perform any additional steps to the commercially available polyamides. Moreover, Kim does not mention the IVs of the commercially available polyamide. The IVs of the commercially available polyamides may be sufficient for Kim's purpose, or alternatively, these IVs may be already greater than 0.6, at which point even Burkett does not teach a need to perform a heating step. Accordingly, because Kim fails to disclose a need to heat commercially available polymers (whether to remove byproducts or increase the IV), Applicants respectfully submit that there is no motivation or suggestion in either reference to increase the IV of commercially available polyamide described in Kim by applying the heating step of Burkett.

The Examiner states that increasing intrinsic viscosity is not necessarily correlated to achieving high orientation or obtaining undesirable levels of haze." (*Office Action* at p. 4.) However, Burkett does teach that "crystallizable copolymers with high molecular weights and high melting points" can be achieved by solid state polymerization. (*Id.* at col. 1, ll. 30-36.) One of ordinary skill in the art would readily appreciate that the crystallization of polymers can lead to cloudier resins and thus, poorer bottle clarity and greater haze. One of ordinary skill in the art would be dissuaded from applying the heating process of Burkett to the containers of Kim where Kim teaches minimizing the haze in bottles.

Although the Examiner has provided a process in Burkett that can be combined with the polymer of Kim, this is not the standard under § 103. The references must suggest the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990); see also M.P.E.P. § 2143.01. As no sufficient motivation has been provided, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and request withdrawal of this rejection.

Kim, Burkett, and Pushee

Claims 33 and 34 have been rejected under 35 U.S.C. § 103 as being unpatentable over Kim in view of Burkett and further in view of U.S. Patent No. 4,392,804 to Pushee et al. ("Pushee"). Applicants respectfully traverse this rejection.

The Examiner admits that neither Kim nor Burkett teach a specific reduced pressure atmosphere or the amount of time required for solid stating. (*Office Action* at p. 3.) To remedy this deficiency, Pushee is cited for disclosing the solid-stating of PET, which would allegedly "intrinsically aid in enhancing the oxygen-scavenging capability." (*Id.*) The Examiner concludes that it would have been obvious to use the conditions taught by Pushee "in the solid stating taught by the combination of Kim et al. and Burkett et al." (*Id.*)

Applicants respectfully disagree. Applicants respectfully submit that because the combination of Kim and Burkett is improper, it necessarily follows that a *prima facie* case of obviousness cannot be established on the basis of Kim, Burkett, and Pushee.

Moreover, it is not necessarily obvious to use the conditions of Pushee to the combination of Kim and Burkett. Pushee is directed to solid stating PET, whereas Kim's polymer is a polyamide. One of ordinary skill in the art would not necessarily conclude that the conditions for solid stating PET would translate to polyamides.

Finally, Pushee explicitly states that high orientation is required for PET bottles to provide sufficient strength with a minimum amount of resin, and intrinsic viscosity of the resin may be critical. (*Pushee* at col. 1, ll. 20-25.) Pushee teaches heating the PET to effect polymerization (increase chain growth) in the presence of either vacuum or an inert gas. (*Id.* at col. 1, ll. 31-40.) Such polymerization can raise the intrinsic viscosity of the PET. (*Id.* at col. 1, ll. 41-47.) Thus, Pushee teaches that a high intrinsic viscosity is critical to maintain the high orientation of PET, and intrinsic viscosity can be increased by heating the resin.

In contrast, Kim teaches that orienting blends of PET and MXD6 causes haze due to refractive index changes and enlarged domains of MXD6. (*Kim* at col. 8, ll. 53-

57.) Kim's solution involves the use of an extrusion blow molding process where the bottle is produced from a polymer in its molten state to minimize orientation. (*Id.* at col. 8, ll. 58-63.) According to Kim, "light passing through unoriented MXD6 structures does not scatter and produce haze." (*Id.* at col. 8, ll. 66-67.)

Applicants respectfully submit that one of ordinary skill in the art would not combine the teachings of Kim and Pushee. Kim states that prior art PET/MXD6 blends suffer from haze, and teaches minimizing the orientation of the resin to reduce haze. In contrast, Pushee teaches a method of achieving high orientation that is necessary for PET by increasing the intrinsic viscosity via heating. One of ordinary skill in the art would avoid Pushee's heating process on the resins of Kim to avoid the haze problem and instead, use the extrusion blow molding process recommended by Kim. The fact that the references teach opposing limits of orientation would preclude the skilled artisan from combining their teachings.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness and request withdrawal of this rejection.

Kim, Burkett, and Katsumoto

Claim 77 has been rejected under 35 U.S.C. § 103 as being unpatentable over Kim in view of Burkett and further in view of U.S. Patent No. 5,776,361 ("Katsumoto"). Applicants respectfully traverse this rejection.

The Examiner admits that Kim fails to teach cobalt neodecanoate as a transition metal catalyst, and thus relies on Katsumoto for allegedly disclosing oxygen scavenging compositions comprising cobalt neodecanoate. (*Office Action* at p. 4.)

Applicants respectfully disagree and respectfully submit that because the combination of Kim and Burkett is improper, it necessarily follows that a *prima facie* case of obviousness cannot be established on the basis of Kim, Burkett, and Katsumoto.

Moreover, Katsumoto does not remedy the deficiency of Kim and Burkett. Katsumoto fails to disclose solid stating at all, much less a solid stating process for the

polyamide of Kim. Accordingly, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness and request withdrawal of this rejection.

Reconsideration

It is believed that all claims of the present application are now in condition for allowance.

Reconsideration of this application is respectfully requested. If the Examiner believes that a teleconference would expedite prosecution of the present application the Examiner is invited to call the Applicant's undersigned attorney at the Examiner's earliest convenience.

Any amendments or cancellation or submissions with respect to the claims herein is made without prejudice and is not an admission that said canceled or amended or otherwise affected subject matter is not patentable. Applicant reserves the right to pursue canceled or amended subject matter in one or more continuation, divisional or continuation-in-part applications.

To the extent that Applicant has not addressed one or more assertions of the Examiner because the foregoing response is sufficient, this is not an admission by Applicant as to the accuracy of such assertions.

Please grant any extensions of time required to enter this response and charge any fees in addition to fees submitted herewith that may be required to enter/allow this response and any accompanying papers to our deposit account 02-3038 and credit any overpayments thereto.

Respectfully submitted,

/Maria T. Bautista/

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Maria T. Bautista, Esq., Reg. No. 52,516
RISSMAN JOBSE HENDRICKS & OLIVERIO, LLP
Customer Number 021127
Tel: (617) 367-4600 Fax: (617) 367-4656